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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/701,491	11/05/2003	Chi Fung Cheng	MP0392	7645

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EXAMINER	
MERCEDES, DISMERY E	
ART UNIT	**PAPER NUMBER**
2651	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/701,491	CHENG, CHI FUNG	
	Examiner	Art Unit	
	Dismery E. Mercedes	2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-59* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,15-17,19,29-31,33,43-47,49-52,54-57 and 59* is/are rejected.

7)☒ Claim(s) *4,6-14,18,20-28,32,34-42,48,53 and 58* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date [illegible].
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 11/05/2005 is being considered by the examiner.

Claim Rejections - 35 USC § 112

2. Claim 15 recites the limitation "a read channel comprising a circuit for correcting an asymmetric signal from said MR head " in page 9, preamble of claim. There is insufficient antecedent basis for this limitation in the claim since there is no previous mention of an MR head.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 1-3,5,15-17,19,43-44,45-47,49,50-52,54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al. (US 6,972,625 B2) in view of Briskin (US 6,721,117 B2).

Nguyen et al. discloses a variable gain amplifier circuit for receiving said asymmetric signal and providing first and second outputs (as depicted in Fig.74-77). Nguyen et al. does not specifically disclose a gm switch coupled to the first output of the variable gain amplifier circuit and providing an output having only a first polarity. However, Briskin discloses such (as depicted Fig.1, 16, 14). Therefore, it would have been obvious to one of ordinary skill in the art to modify the circuit as disclosed by Nguyen et al. by implementing a gm switch as disclosed by Briskin et al. the motivation

being to provide such circuit with ability to selectively switch input voltage offset compensation between positive and negative shunt feedback, thus suppressing disturbances (col.3, lines 40-55 of Briskin). Nguyen et al. does not specifically disclose wherein the second output of the variable gain amplifier circuit and the output of the gm switch are combined to provide a corrected signal. However, Nguyen discloses a differential amplifier and a linearization circuit with similar connections to provide a linear output (Fig.31b). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the circuit as disclosed by Nguyen et al. and Briskin with the above connection as disclosed by Nguyen et al., the motivation being to provide an equalized and linear response with an improved dynamic range (col. 44, lines 12-18 of Nguyen et al.).

As to Claim 2, Briskin further discloses wherein said gm switch comprises: a first switching circuit; a second switching circuit; and a differential amplifier coupled to said first and second switching circuits (as depicted in Fig.1, "12", "16", and "14").

As to Claim 3, Briskin further discloses wherein each of said first and second switching circuits comprises at least one transistor operated in saturation (col.5, lines 8-60).

As to Claim 5, Nguyen et al. further discloses wherein said variable gain amplifier circuit comprises a two- stage variable gain amplifier, a first stage providing said first output and a second stage providing said second output (as depicted in Fig.74-77 & 80G).

As to Claims 15-17,19 have limitations similar to those treated in the above rejection of claims 1-3,5 and are met by the references as discussed above. Claim 15, however also recites the limitation: "a read channel comprising circuit for correcting an asymmetric signal from said MR head." However, Briskin discloses such (see abstract).

As to Claims 43-44 are method claims drawn to the apparatus of claims 1-2, and are therefore rejected for similar reasons as set forth in the rejection of claims 1-2 above.

As to Claims 45-47,49 have limitations similar to those treated in the above rejection of claims 1-3,5 and are met the by references as discussed above.

As to Claims 50-52,54 have limitations similar to those treated in the above rejection of claims 15-17,19 and are met the by references as discussed above.

5. Claim 29-31,33,55-57,59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goh et al. (US 6,519,106) in view of Briskin (US 6,721,117 B2), further in view of Nguyen et al. (US 6,972,625 B2).

As to Claim 29, Goh et al. discloses a hard disk drive comprising at least one disk having a surface for storing data thereon; at least one magneto-resistive (MR) read head for reading information recorded in data tracks on the at least one disk; a servo actuator for positioning the at least one MR head with respect to the at leas one disk; and a read channel for transmitting data from the at least one MR head; wherein the read channel comprises a circuit for correcting an asymmetric signal received from said MR head, a variable gain amplifier circuit for receiving said asymmetric signal and providing first and second outputs (Figs.2-3 and col.3, line 40-col.4, line 58; col.5, lines 5-15). Goh et al. fails to particularly disclose a gm switch coupled to the first output of the first variable gain amplifier circuit and providing an output having only a first polarity, wherein the second output of the variable gain amplifier circuit and the output of the gm switch are combined to provide a corrected signal.

However, Briskin discloses such (as depicted Fig.1, 16, 14). Therefore, it would have been obvious to one of ordinary skill in the art to modify the hard disk drive as disclosed by Goh et al. by

implementing a gm switch as disclosed by Briskin et al. the motivation being to provide the disc drive with the ability to selectively switch input voltage offset compensation between positive and negative shunt feedback, thus suppressing disturbances (col.3, lines 40-55 of Briskin). Goh et al. does not specifically disclose wherein the second output of the variable gain amplifier circuit and the output of the gm switch are combined to provide a corrected signal. However, Nguyen discloses a differential amplifier and a linearization circuit with similar connections to provide a linear output (as depicted in Fig.31b). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the drive as disclosed by Goh et al. and Briskin with the above connection as disclosed by Nguyen et al., the motivation being to provide an equalized and linear response with an improved dynamic range (col. 44, lines 12-18 of Nguyen et al.).

As to Claims 30-31,33 have limitations similar to those treated in the above rejection of claims 2-3,5 and are met by the references as discussed above.

As to Claims 55-57,59 have limitations similar to those treated in the above rejection of claims 29-31,33 and are met by the references as discussed above

Allowable Subject Matter

6. Claims 4,6-14,18,20-28, 32,34-42,48,53,58 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Note: Claims 6, 20 & 34 are allowable over the prior art of record since the cited references fail to disclose: *a transconductance circuit for receiving the asymmetric signal and for providing a current proportional to the asymmetric signal in a first and a second current path; a first switching circuit, having a first and a second input, said first switching circuit being coupled to the first current path; a second switching circuit, having a third and a fourth input, said second switching circuit being coupled*

to the second current path; a first current source coupled to the first and the third inputs; a second current source coupled to the second and fourth inputs; and a third current source coupled to the transconductance circuit, wherein the first switching circuit is responsive to the asymmetric signal for switching the first current source to the first current path or to the second current path, and wherein the second switching circuit is responsive to the asymmetric signal for switching the second current source to the first current path or to the second current path.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Spanoche (US 6,538,491 B1); Bowers et al. (US 5,736,899); Sugawara et al. (US 5,790,335); Rezzi et al. (US 6,043,943); Sugawara et al (US 6,052,245); Hiramatsu (US 6,072,647); Mathews et al. (US 6,366,417); Gowda et al. (US 6,529,340).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dismery E. Mercedes whose telephone number is 571-272-7558. The examiner can normally be reached on Monday - Friday, from 9:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne R. Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DM

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER